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Stable complexes of tertiary ammonia derivative of phenothiazine with tertramethylsulfonated resorcin[4]arenes obtained under substoichiometric conditions

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Abstract

Eight water insoluble complexes of tetramethylsulfonated calix[4]resorcinarenes 1 and 2 (-CH3 and -C5H 11) with phenothiazine derivative, 3, were obtained under substoichiometric conditions by mixing aqueous solutions of the initial reagents. It was found that complexation of cationic 3 by macrocycles was provided by both Coulomb interaction with the negative sulfonato-groups on the upper rim and by cation-π interactions with the aromatic cavity. The complexes precipitated and, therefore, were studied in organic solvents-DMSO, CD3OD, and CDCl3 using IR-, UV-, and NMR- spectroscopy. Formation of the complexes accompanied by gradual dehydratation of the host-estimated quantity of water in the complexes decreased with increase of the initial concentration of 3. Driving forces of precipitation and complexation, the role of water coordinated by the hosts, and distribution of phenothiazine derivative between two kinds of binding sites are discussed. © 2007 Springer Science+Business Media, Inc.

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Keywords

Association, Host-guest systems, Multiple interactions, Phenothiazine, Resorcinarene, Self-diffusion